UNITED STATES PATENT AND TRADEMARK OFFICE

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10/575,160	07/10/2006	Fumiyuki Adachi	8075-1083	6828

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EXAMINER
GARCIA, SANTIAGO

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
12/31/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DocketingDept@young-thompson.com

		Application No.	Applicant(s)	
Office Action Summary		10/575,160	ADACHI, FUMIYUKI	
		Examiner	Art Unit	
		SANTIAGO GARCIA	2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>13 October 2009</u>.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>26-46</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) <u>26-46</u> is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All b) ☐ Some * c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments, see pages 18-23, filed 10/13/09, with respect to all claims

argued have been fully considered and are persuasive. The previous rejections have

been withdrawn. However a new rejection applies.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

3.   Claim 26-40 and 42-45 are rejected under 35 U.S.C. 102(e) as being anticipated

by Arivoli (US 7,170,849).

As per claim 26, Arivoli teaches a transmitter apparatus for performing

transmission using transmission signals generated on the basis of data symbols of a

specified transmission method (Arivoli, fig.1 100), said transmitter apparatus

comprising:

an interleaver (Arivoli, fig.1 108 interleaving) **for generating interleave-**

processed data being obtained by performing specified rearrangement processes

(Arivoli, fig.1 and fig.2 showing the details of the interleaver. See col 5 lines 27-31

which discloses that the interleaver rearranges 288 bits as 16 rows and 18 columns) **on**

frequency domain data to which said data symbols are converted (Arivoli, fig.1

element 150 FFT converting the symbols which are received by 108 to frequency

domain. Therefore the symbols that get to the interleaver are frequency domain

converted symbols by the MAC 156 giving the input to the transmitter   ) and

      an IFFT processing part for converting said interleave-processed data to

time domain signals (Arivoli, fig.1 element 110 IFFT input to the interleaver), wherein;

      said interleaver generates and outputs N pieces of data from Q (N>Q) data

symbols inputted (Arivoli, see col 6 table 1 and col 5 lines 27-41 and col 6 lines 1-7

Ncbps (coded bits per symbol) is equal to 48 Nbpsc (bits per subcarrier) and then if

there are 3 groups of Nbpsc per row and the output contains 16 rows then the input

Ncbps (Q) is smaller than the output Nbpsc (N) three groups of such. Making N (Output

Nbpsc) > Q (Ncbps input)   ).

      As per claim 27, Arivoli further teaches, a transmitter apparatus according to

claim 26, being N/Q columns (Arivoli, col 6 and 5 row column   ), characterized by further

comprising an FFT processing part for converting said data symbols to said frequency

domain data (Arivoli, fig.1 element 150 FFT converting the symbols which are received

by 108 to frequency domain. Therefore the symbols that get to the interleaver are

frequency domain converted symbols by the MAC 156 giving the input to the transmitter

).

As per claim 28, Arivoli further teaches, a transmitter apparatus according to claim 26, being characterized in that said FFT processing part performs Q-point FFT processes, on Q data symbols inputted (Arivoli, fig.1 FFT 150 and data inputted is data into the FFT   ).

As per claim 30, Arivoli teaches, a transmitter apparatus according to claim 26, comprising:

said interleaver is provided with an interleaver memory for storing output data of said FFT processing part (Arivoli, fig.2 inleaver memory array),

data of Q points outputted data of Q points outputted from said FFT processing part are written into specified positions in said interleaver memory (Arivoli, fig.2 memory array read and write address 204),

and specified N pieces of data including Q pieces of data written into said specified positions and data written into other positions than the positions into which said Q pieces of data are written are read from said interleaver (Arivoli, fig.2 output 212 being read out).

As per claim 29, Arivoli further teaches, a transmitter apparatus according to claim 26, being characterized in that said IFFT processing part performs N-point IFFT processes on N pieces of data outputted from said interleaver (Arivoli, fig.1 element 110 IFFT input to the interleaver. See fig.2 interleaver 200 going to IFFT. See col 5 lines 1-10 the bits are read out and re-ordered on a bit by bit basis   ).

As per claim 31, Arivoli further teaches, a transmitter apparatus according to claim 26, being characterized in that specified N pieces of data read from said interleaver memory are outputted to said IFFT processing part (Arivoli, fig.2 element 200 are the insides of the interleaver containing 202 memory array).

As per claim 32, Arivoli further teaches, a transmitter apparatus according to claim 26, being characterized in that data symbols of said specified transmission method are spread signals (including the case of spreading rate of 1) (Arivoli, see col 18 lines 2-4 the low reliability bits are spread in group permutations).

As per claim 33, Arivoli, further teaches, a transmitter apparatus according to claim 26, being characterized in that data symbols of said specified transmission method are multi-carrier signals (Arivoli, see table 1 and description thereof showing that the signals are multi-carrier signals. Arivoli, See abstract and field of the invention).

As per claim 34, Arivoli, further teaches, a transmitter apparatus according to claim 26, being characterized in that data symbols of said specified transmission method are OFDM signals (Arivoli, See abstract and field of the invention).

As per claim 35, Arivoli, further teaches, a transmitter apparatus according to claim 26, being characterized in that data symbols of said specified transmission method are data symbols of variable data rate (Arivoli, Table 1 showing different modulation rates which constitute to different data rates).

As per claim 36, Arivoli teaches, a communication system comprising;

a transmitter apparatus for performing transmission using transmission signals generated on the basis of data symbols of a specified transmission method (Arivoli, fig.1 102)

and a receiver apparatus for restoring said data symbols on the basis of the received reception signals obtained by receiving said transmission signals, said system being characterized in that (Arivoli, fig. 1 103);

said transmitter apparatus comprises an interleaver for generating interleave-processed data being obtained by performing specified rearrangement processes on frequency domain data to which said data symbols are converted and (Arivoli, fig.1 108 and fig.2 200 interleaver. See col 5 lines 27-31 which discloses that the interleaver rearranges 288 bits as 16 rows and 18 columns)

an IFFT processing part for converting said interleave-processed data to time domain signals (Arivoli, fig.1 IFFT 110),

and said receiver apparatus comprises an FFT processing part for converting time domain signals to frequency domain data (Arivoli, 103 receiver contains element 150 to convert to frequency domain)

and a de-interleaver for generating de-interleave-processed data being obtained by performing specified rearrangement processes on said converted frequency domain data (Arivoli, fig.1 de-interleaver after the FFT in element 103),

wherein; said de-interleaver generates and outputs Q pieces of data from N (N>Q) pieces of data inputted (Arivoli, Tables 4 and 5).

As per claim 37, Arivoli, further teaches, a communication system according to claim 36, comprising said transmitter apparatus further comprises an FFT processing part for converting said data symbols to said frequency domain data (Arivoli, fig.1 FFT), and said receiver apparatus further comprises an IFFT processing part for converting said de-interleave-processed data to time domain signals (Arivoli, fig.1 output of FFT going to de-interlaver and 104 receiving and therefore receiving the de-interleavered output).

As per claim 38, Seki further teaches, a communication system according to claim 36, being characterized in that said FFT processing part of said receiver apparatus performs N-point FFT processes on N pieces of reception data which have been received and converted from serial to parallel (Arivoli, fig.1 FFT 150 152 de-mapping is converting from serial to parallel, see tables 4-5   ).

As per claim 39, Seki teaches, a communication system according to claim 36, being characterized in that said IFFT processing part of said receiver apparatus IFFT

processes performs Q-point on Q pieces of rearrangement-processed data outputted

from said de-interleaver (Arivoli, fig.1 110 IFFT receiving part 104 from 156 and being

output of frinterlaver 152).

As per claim 40, Arivoli, further teaches, a communication system according to

claim 36, being characterized in that; said de-interleaver is provided with a de-

interleaver memory for storing output data of the FFT processing part of said receiver

apparatus (Arivoli, fig.6 memory array),

data of N points outputted from the FFT processing part of said receiver

apparatus are written into specified positions in said de-interleaver memory (Arivoli, fig.6

memory array, read/write address 618),

and Q pieces of data written into specified positions as data to be processed out

of N pieces of data written into said specified positions are read from said de-interleaver

(Arivoli, fig.6 memory array going to 622 which means the memory output 614 is being

read out   ).

As per claim 42, Seki further teaches a communication system according to claim

36, being characterized in that data symbols of said specified transmission method are

spread signals (Arivoli, see col 18 lines 2-4 the low reliability bits are spread in group

permutations)

As per claim 43, Seki further teaches, a communication system according to claim 36, being characterized in that data symbols of said specified transmission method are multi-carrier signals (Arivoli, see table 1 and description thereof showing that the signals are multi-carrier signals. See abstract and field of the invention   ).

As per claim 44, Seki further teaches a communication system according to claim 36, being characterized in that data symbols of said specified transmission method are OFDM signals (Arivoli, see table 1 and description thereof showing that the signals are multi-carrier signals. See abstract and field of the invention).

As per claim 45, Seki further teaches, a communication method being a transmission method for performing transmission using transmission signals generated on the basis of data symbols of a specified transmission method (Arivoli, fig.1), said communication method comprising:

an FFT processing step for converting said data symbols to frequency domain data (Arivoli, fig.1 150 FFT),

an interleave-processing step of performing rearrangement processes on said converted frequency domain data (Arivoli, fig.1 108),

and an IFFT processing step of converting said frequency domain data to time domain signals, wherein (Arivoli, fig.1 IFFT) to the subcarrier signals that enter in parallel, thereby effecting a conversion to an OFDM signal (Arivoli, table 1);

said interleave-processing step generates and outputs N pieces of data from Q (N>Q) data symbols inputted (Arivoli, see col 6 table 1 and col 5 lines 27-41 and col 6

lines 1-7 Ncbps (coded bits per symbol) is equal to 48 Nbpsc (bits per subcarrier) and

then if there are 3 groups of Nbpsc per row and the output contains 16 rows then the

input Ncbps (Q) is smaller than the output Nbpsc (N) three groups of such. Making N>Q

disclosed here).

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arivoli

(US 7,170,849) in view of Tsai (US 7,330,513).

As per claim 41, Arivoli further teaches, a communication system according to

claim 36, being characterized in that specified Q pieces of data read from said de-

interleaver memory (Arivoli, fig.6 output of 614) .

Arivoli does not clearly teach, are outputted to said IFFT processing part of a

receiver apparatus.

Tsai teaches, having an interleaver/de-interleaver in front of a IFFT (Tsai, col 4

lines 4-7 and claim 6).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to modify Arivoli to include an IFFT at the output of the de-interleaver as

taught by Tsai and as suggested by Arivoli that both the interleaver and de-inleaver do

vise-versa functions as one of ordinary skill in the art would know.

The motivation would be to fairly treat the symbols in the frequency domain as

taught by Tsai in col 4 lines 4-7 and in claim 6.

5.   Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arivoli

(US 7,170,849).

As per claim 46, Arivoli teaches a communication method comprising;

a transmission step of performing transmission using transmission signals

generated on the basis of data symbols of a specified transmission method and a

reception step of receiving transmission signals transmitted by said transmission step

and restoring said data symbols, comprising:

said transmission step comprises an FFT processing step of converting said data

symbols to frequency domain data (Arivoli, fig.1 FFT 150),

an interleave-processing step of performing interleave processes on said

converted frequency domain data (Arivoli, fig.1 108) and an IFFT processing step of

converting said frequency domain data to time domain signals (Arivoli, fig.1 110),

and said reception step comprises an FFT processing step of converting said

time domain signals to frequency domain data (Arivoli, FFT in fig.1 receiving part),

a de-interleave-processing step of performing rearrangement processes on said converted frequency domain data (Arivoli, fig.1 after FFT de-interleaver 152)

and an IFFT processing step of converting said frequency domain data to time domain signals, wherein (Arivoli, fig.1 IFFT 110);

said interleave-processing step generates and outputs N pieces of data from Q (N>Q) data symbols inputted (Arivoli, Arivoli, see col 6 table 1 and col 5 lines 27-41 and col 6 lines 1-7 Ncbps (coded bits per symbol) is equal to 48 Nbpsc (bits per subcarrier) and then if there are 3 groups of Nbpsc per row and the output contains 16 rows then the input Ncbps (Q) is smaller than the output Nbpsc (N) three groups of such. Making N>Q disclosed here)

However Arivoli does not clearly teach, and said de-interleave-processing step generates and outputs Q pieces of data from N (Q<N) pieces of data inputted.

Furtheremore at the time of the invention it would have been obvious to one of ordinary skill in the art to modify Arivoli as suggested by Arivoli itself to have the interleaver and de-interleaver do the opposite functions see col 5 lines 18-26.

The motivation would have been to have a more flexible system as taught by Arivoli in col 5 lines 20-25.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SANTIAGO GARCIA whose telephone number is (571)270-5182. The examiner can normally be reached on MONDAY- FRIDAY 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh, Fan can be reached on (571) 272-7305. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SG/

/CHIEH M FAN/

Supervisory Patent Examiner, Art Unit 2611